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EXAMINER	
GREEN, RICHARD R	

ART UNIT	PAPER NUMBER
3644	

MAIL DATE	DELIVERY MODE
11/20/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,700	EICHHOLZ ET AL.	
	Examiner	Art Unit	
	Richard R. Green	3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/30/2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims **20 and 25** are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Parent claim 16 requires that fluid isolation be maintained between the air in the panels and the air in a cabin of the aircraft, however claims 20 and 25 describe that the air be directed from the panels into the cabin. Presently, the claimed embodiment of venting into the cabin is capable of being infringed without infringing upon the parent claim, which on its face requires that air from the floor never vent into the cabin.

From Applicant's arguments (Remarks 6/30/2009 pages 8-10), it appears that what was meant was that fluid isolation is maintained for some distance; the floor is not porous and the air does not vent to the cabin until which point claims 20 and 25 allow it to do so. However, "maintaining fluid isolation" as a method step without a qualifying statement reads that it is not enough that the fluid is isolated briefly, that isolation is present at some point in time, but that such isolation should be maintained. Claim 16 should have some modifying statement regarding when isolation is maintained (a length of the floor, perhaps), or at least that it may not be maintained indefinitely.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims **20 and 25** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim **20,** it is not clear how the fluid isolation of claim 16 is being maintained if the air is vented into the fuselage.

Regarding claim **25,** it is not clear how the fluid isolation of claim 16 is being maintained if the air is directed into the cabin after it has cooled. Perhaps in the parent claim, a more particular description of where or when isolation is maintained could clear up the claim language.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1, 2, 9, 14-18, 24 and 25** are rejected under 35 U.S.C. 102(b) as being anticipated by USPN-4819720 to Howard.

Regarding claims **1, 16 and 18,** Howard teaches an aircraft (fig. 2) including avionics equipment (fig. 3, at 13) in an avionics bay (fig. 3, at 15), the aircraft also including:

a floor within the aircraft (fig. 3 or 5: specifically here considering the liner cover 36 to be a floor within the aircraft; regardless of whether it might support the weight of a person, it is a uniform covering for the lower portion of chamber 35, which covering forms the bottom surface of the chamber 35, being the floor of chamber 35) made up of heatable panels (col. 5, lines 26-33: the liner and envelope are segmented into smaller bays, appearing like panels in fig. 5) defining a plurality of first hollow chambers formed integrally within the panels (fig. 5, envelopes at 19 are hollow chambers) wherein each chamber has a first and second end (fig. 5, at 19); and

a feed line operatively connected to the first ends of the first hollow chambers and providing fluid communication between the avionics bay and the first ends of the first hollow chambers (fig. 3, at 39; alternatively at 21; both of these elements serve to provide fluid communication), the feed line supplying warm waste air to the hollow chambers, the warm waste air originating from the cooling of the electronic equipment contained in the avionics bay (fig. 3: air arriving from bay 15 feeds through the flooring 39; col. 4, lines 44-53);

in this system, fluid isolation is maintained between the air in the avionics cooling / floor heating circuit and air in a cabin (fig. 3, at 33) of the aircraft (fig. 3; abstract: "closed loop system").

Regarding claims **2 and 17,** the first hollow chambers of Howard extend in the longitudinally direction of the aircraft inside the panels (fig. 2), the warm waste air flowing longitudinally therethrough (at least to a degree, some air will inherently flow in

the longitudinal direction, at least in fig. 2, where air in the front must flow backwards to recirculate through the avionics bay).

Regarding claim **9,** the panels of Howard are thermally uncoupled from a structure which supports the floor (fig. 2: the landing gear support the aircraft, and by extension the floor, and are reasonably thermally uncoupled from the panels).

Regarding claim **14,** the panels of Howard are provided with thermal insulation on their lower side (fig. 6, the skin at 23 provides some degree of thermal insulation greater than zero).

Regarding claim **15,** the panels of Howard are profile elements (fig. 5; the limitation "produced by continuous extrusion" is a product-by-process limitation and the final structure of Howard is not critically materially distinct from the claimed structure).

Regarding claim **24,** a forced flow is generated in the hollow chambers of Howard (col. 4, lines 31-43, col. 5, lines 3-16; figs. 1, 3; fan at 17 generates a forced flow, as does the pressure in plenum 35).

Regarding claim **25,** the air from the first hollow chambers is directed back into the cabin after the warm waste air has cooled (fig. 3: the air returns up through the passenger cabin to the avionics bay after the warm waste air has cooled, the avionics bay being a sort of cabin of itself, though the system is closed loop and the air does not interact with the passenger cabin air).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **1, 2, 4, 5, 9, 13-20, 24 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over the C-130 as described in the EAWS document in view of USPN-6883590 to Messana and USPN-4819720 to Howard.

Regarding claims **1, 2, 4, 5, 9, 14-20, 24 and 25,** The C-130 Hercules (as taught by the EAWS document) is a cargo transport aircraft with an aft-cargo door/ramp (EAWS section 201.1.6 c) and a ducted underfloor heating system using hot air (201.1.7 c; this implicitly indicates that a forced flow is generated in hollow ducts of the floor); the C-130 also has an avionics bay containing electronic equipment (203.1+).

The EAWS document is silent on the precise configuration of the underfloor hot air ducting system, as well as the source of the hot air and any method to cool the included avionics equipment.

Messana teaches a modular heated panel system arrangeable in independent circuits, using a heated fluid medium (fig. 5), the system including:

heatable panels (fig. 5) defining first and second pluralities of hollow chambers (fig. 5: first hollow chambers are those pipes 3 of the left circuits; second hollow chambers are those pipes 3 of the right circuit, past the section VI; pipes 11 are also hollow chambers) wherein each chamber has a first and a second end (fig. 5); and

feed lines operatively connected to the first ends of the first and the second hollow chambers and providing fluid communication thereto from a heat source (fig. 5: feed lines 8; it can be seen that the right-hand heating circuit has its own feed line 8; col. 6, lines 17-21 indicate that these lines supply the heating fluid);

the hollow chambers extend in the longitudinal direction (the longest sections of the chambers do extend in the longitudinal axis of the panel arrangement, but they also extend in the cross-direction by their serpentine nature);

the cross sections of the feed lines determine the amount of fluid supplied (this is an inherent fact of pipe cross sections, in that fluid mass flow is defined by the function mass flow rate = density of the fluid * Velocity of the fluid * cross sectional Area of the pipe); and

the panels are profile elements (fig. 5) and are provided with thermal insulation on their lower side (fig. 6a, at 2).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to configure the heated floor ducting system of the C-130 in the manner of Messana, because the panels of Messana are quick to install and do not require specialized knowledge to install (Messana col. 2, lines 44-48). It would further have been obvious to a person of ordinary skill in the art at the time of the invention to arrange an independent heating circuit on the cargo ramp of the C-130 as well, to prevent icing and to provide even heating of the enclosed cargo area, and in so doing, one of the separate feed lines 11 would be directed toward heatable panels on the

cargo door, in addition to the feed line already supplying heating fluid to the panels of the cargo bay floor. In so doing it would either be necessary or obvious for:

the hollow chambers to extend longitudinally (as previously stated, the chambers extend in both directions, however it would be more obvious to install the panels of Messana lengthwise, in which case the longest segments of piping 3 would of necessity align in the longitudinal direction);

the panels to be thermally uncoupled from a structure which supports the floor (the landing gear is distant enough from the floor to be thermally uncoupled, and supports the floor while the craft is on the ground); and

fluid isolation to be maintained between the heating fluid and air in a cabin of the aircraft (the circuits of Messana do not show a vent to ambient; at the very least fluid isolation is maintained until after the air passes through the panels, which is the same extent as Applicant's invention);

the heating fluid to pass from the panels of the floor to the panels of the door (fig. 5: hollow chambers 11 operatively fluidly connect the first set of panels to the next, and air flows from the second end of one set into the first end of the next); and

the second hollow chambers terminate into the aircraft fuselage (in that, there must be a last panel, and the piping 11 must terminate at that point).

It is considered within the skill of one in the art to optimize the relative dimensions of the panels and embedded chambers for the usage of heated air as a specific heating fluid, though neither the EAWS document nor Messana teach the use of warm waste air from the cooling of aircraft electronic equipment as the heating fluid.

Howard teaches an avionics cooling system whereby air is used to cool avionics, and then vented to the floor of the aircraft to cool the air, using the ambient air as a heat sink (Howard fig. 3). It would have been obvious to a person of ordinary skill in the art at the time of the invention to cool the avionics of the C-130 in a fashion similar to that of Howard, only routing the air through channels in the panels of Messana and using the cabin air as a heat sink (the ambient air would also be a heat sink, at least indirectly, particularly for the panels on the cargo door), for the double purpose of cooling the avionics equipment and providing a heating fluid for the panels of the floor.

In so doing, the warm waste air would flow through the first panels of the floor, and then the second panels of the door (through piping 11 of Messana), and then back into the fuselage/cabin (insofar as the avionics bay is part of the fuselage/cabin).

Regarding claim **13,** in addition to the discussion above, it would have been obvious to a person of ordinary skill in the art at the time of the invention to include the fan 17 of Howard (fig. 3) in the feed lines (either 8 or 11) of Messana (fig. 5) to provide a forced flow through the hollow chambers and ensure that sufficient heat exchange takes place.

Claims **6-8, 21 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over EAWS in view of Messana and Howard as applied to claims 1, 16 and 19 above, and further in view of USPN-6058725 to Monfraix et al. (hereafter Monfraix).

Regarding claims **6-8, 21 and 22,** Messana and Howard are both silent on using hot engine bleed air to heat the floor; the C-130 may use hot engine bleed air to heat

the floor, however the EAWS document is silent on this aspect; none of the documents teach using both warm waste air from the avionics in combination with hot engine bleed air.

Monfraix teaches a system of providing aircraft cabin temperature control using in part hot engine bleed air (col. 1, lines 5-10), but whereby a desired temperature of supplied air flow is achieved by mixing the bleed air with other air flows (col. 2, lines 13-16, 48-51; col. 8, lines 30-32; fig. 1), particularly adding direct hot bleed air when air of an intermediate temperature is insufficient to heat the desired area to a required temperature (col. 2, lines 48-51). It would have been obvious to a person of ordinary skill in the art at the time of the invention to use hot engine bleed air to supplement the warm waste air in the event that the warm waste air did not suffice to raise the temperature of the cabin to a desired level, as in Monfraix;

in so doing, hot engine bleed air would be supplied through the piping 8 and 11 of Messana, such that second ends of the first hollow chambers supply hot bleed air to the hollow chambers of the panels forming the floor of the cargo door of the C-130 via the second feed line (see Messana fig. 5, particularly if it takes more than one panel to cover the floor of the cargo door); since each panel has its own feed line, but every feed line passes through the earlier panels, a new source of hot bleed air mixed with warm waste air arrives at every panel in turn, after having passed through the previous panels, but not having passed through the serpentine portion of the previous panels.

The limitations of claim 8 have already been addressed; it is an inherent physical fact that cross sectional area determines the mass flow of a fluid passing through a pipe.

Claims **10-13 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over EAWS in view of Messana and Howard as applied to claims 1 and 16 above, and further in view of US-2002/0056787 to Wilson, Jr. et al. (hereafter Wilson).

Regarding claims **10-12 and 23,** EAWS, Messana and Howard are silent on electric heating. Wilson teaches an aircraft supplemental electric air heater, to be installed inline with a hot air supply duct, downstream of a fan (figs. 1, 2 and 6; heater at 10 and 110, fan at 118), which is meant to contribute additional heat to an existing hot air heating system for portions of the floor which are not sufficiently heated, such as areas near the doors (paragraph 3). The heating element of Wilson is electric (paragraph 5), and may comprise a heating coil (paragraph 6). It would have been obvious to a person of ordinary skill in the art at the time of the invention to install the supplemental electric heater of Wilson in the hollow chambers (either 8 or 11; particularly 8, for superior control of which panels receive supplementary heat, such as only those near doors) of the panels of Messana installed in the aircraft of EAWS in view of Messana and Howard, to supplement the warm waste air for colder portions of the floor. Once installed, this air heater would provide:

electric heating mats for supplementary heating (the coiled composite may loosely be considered a heating mat, since it provides heat and is essentially flat, though coiled), positioned on the lower side of the panels (positioned below the top

layer: see Messana fig. 3; the piping is located on the lower side of the layer 1, and the supplemental heater will be located in such a position), and the heating coil would be integrated into the hollow chambers (being inline).

Regarding claim **13,** in addition to the discussion above regarding claims 10-12 and 23, it would have been obvious to a person of ordinary skill in the art at the time of the invention to include the fan 118 of Wilson with the inline heater to assist the air past the heater, since its presence constricts the cross sectional area of the pipe, and once included a ventilator would be positioned in the first hollow chambers to generate a forced flow.

Response to Arguments

Applicant's arguments filed 6/30/2009 have been fully considered but they are not persuasive.

Regarding the claim objections and rejections under 35 USC 112, 1st and 2nd paragraph, the amendment to claim 16 has placed the claim where it appears that remaining issues are restricted to wording, and the rejection under 35 USC 112, 1st paragraph has not been applied in this Action. However, even as amended, claim 16 requires that fluid isolation be maintained between the warm waste air in the hollow chambers and air in the cabin. The problem lies perhaps in the word "maintain" without a modifying phrase, implying that the isolation is kept indefinitely. Perhaps claim 16 could describe that the fluid isolation is maintained for the length of the hollow

chambers, allowing the air to mix after exiting the chambers without violating the step of maintenance.

Applicant argues (Remarks pages 11-13) that Howard fails to teach warm waste air flowing through hollow chambers in the floor. Applicant asserts that because Howard already provides for floorboard 37, that the liner cover 36 cannot also be considered as a floor, and that one skilled in the art would not recognize it as such. This assertion is not persuasive. The liner cover forms the top surface of the structure forming the bottom boundary of the chamber 35. With particular reference to figures 3-5, in each of these figures, the cover 36 clearly forms the floor of chamber 35. If this floor is not a floor which passengers commonly walk upon, and warming this floor does not serve to warm an area in which passengers are seated, these limitations are absent from the claims.

In response to Applicant's arguments that '[t]here are no "plural hollow chambers," just one large envelope 19' (Remarks page 12, ¶ 3 – page 13, ¶ 1), reference is made to Howard col. 5, lines 26-33: "In preferred embodiment 12, liner 25 and envelope 10 are comprised of a plurality of juxtaposed liners and envelopes located in small transverse bays separated by annular support frames, rather than being one unbroken liner 25 and envelope 19". Any cross-mixing of air within the space within the envelopes 19 is immaterial to the scope of the claims. No fluid isolation is claimed to be maintained among the hollow chambers themselves.

In response to Applicant's arguments that the floor panels of Messana are unsuitable for use as flooring in an aircraft (Remarks page 14, ¶ 1), it is not clear that

floor panels are not analogous art for use in a floor, particularly when both floors are taught to be heated by hot air, merely because one floor is in an aircraft and the other is not. In response to applicant's arguments against the references Messana, EAWS and Howard individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard R. Green whose telephone number is (571)270-5380. The examiner can normally be reached on Monday - Thursday 8:00 am - 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mansen can be reached on (571)272-6608. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael R Mansen/
Supervisory Patent Examiner, Art Unit 3644

/R. R. G./
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